

# **Man and Nature—In Dialogue with Newton and Needham**

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## **1. Introduction**

Since ancient times, humans have embarked on the journey to make sense of nature—by observation, logical reasoning, quantification or simply intuition. From the vast array of views and theories generated, we critically filter, consolidate and build up the system of modern science, and from which we seek to empower ourselves with a fuller understanding of the domain we live in. Yet, never has a system been built without limitations (Yerrick, Linda and Pederson 49). The modern system may possibly be flawed and components that it omitted may be the missing pieces in acquiring the ultimate truth. The time to reflect upon how we can reveal our world more comprehensively has come, and it was my utmost pleasure to have Mr. Joseph Needham and Mr. Isaac Newton discuss related issues in a seminar.

## **2. On Nature of Science**

### **2.1 Newton and Needham's argument**

Their perception towards modern science converged. On the one side, "Newton declined to credit authors who tossed off general statements

without being able to prove them mathematically” (Cohen 51), “and confirmed by an abundance of experiments” (55). On the other side, Needham, in *Science and Civilisation in China*, defined modern science as “the combination of mathematised hypotheses about natural phenomena with relentless experimentation” (1).

Their views subsequently diverged on whether the Chinese thought-system hinted a raw form of science. Newton saw that the thought-system is too primitive for the fact that anything can be caused by anything else. He further elaborated on the absurdity of the number-mysticism with his mathematical principles—his quantitative laws can be tested and the mathematical conditions can be exemplified in nature, while the number-mysticism makes unjustified quantification and forced linkage among numerical categories. Needham responded by stating that the Chinese-thought system has advanced from the primitive thoughts—as the universe of events has been categorized in the fivefold system, anything can no longer be the cause of anything. Such a systematized universe is governed by order and pattern, and things behave by following patterns intrinsic to their nature. The system showcased a delicate world of interdependency, with distinctive focus on categorization, generalization and laws of cause and effect. In response to the mystified use of numbers, Needham admitted that numerology “contributed little of scientific value, but equally important, it does not appear to have had any really bad effect either” (*Shorter Science* 217).

## 2.2 My Stance

I agreed with Newton that the Chinese thought-system has major shortcomings. First, it is short of predictive power. The predictions fell short of fitting the reality. Take the symbolic correlation with animals as an example: a rooster is connected with Metal and a hare with Wood. Yet if we

follow the Mutual Conquest Order, roosters will consume hares, and this is too far away from the observation of nature. On the other hand, Newtonian physics demonstrated high predictive power, as a comet reappeared right at the time calculated by Edmond Halley (Cohen 61).

Second, it lacks objectivity. The Five-Element Theory shows weakness in the universality of application. By common sense water helps with extinguishing fire, yet the effectiveness of firefighting depends on the relative quantity of Fire and Water. Hence the underlying complication is that there exists no quantitative element to support the theory. Newton's Laws of Motion acts as the perfect counterexample, as the mathematical basis provides much accuracy in connecting inputs with outputs (results).

Third, its generalization is over-elaborative. I believe that the basis of the Five-Element Theory, be it the Enumeration Orders or the secondary principles, are sound by building upon association and intuition. But when the system incorporates everything in a fivefold arrangement, many of the classifications will be far-fetched. With a myriad of unknowns and variables, it becomes improbable that a limited number of rules can give rise to a holistic view on nature. Western science (or Newtonian physics) conversely introduces laws or theories that apply to a definite domain, instead of extending to the whole of the universe.

With the abovementioned arguments, it seems that the Newtonian physics, being falsifiable, objective and with great predictive power, fits modern science standard better than the Chinese thought-system. However with that in mind, I would treat the thought-system as a raw form of science that displayed unique insight on nature, instead of some fruitless gibberish. The intention to categorize, generalize and logically interrelate organisms (both externally to the world-organism and intrinsically to own nature) serves as important indications for a new science. This system is very comparable

to what Aristotle described as “potential being”, possibly but not definitely changing to “actual being”, i.e. modern science. The rationale behind affirming the system’s potential is as follows: Associative thinking is a system that works by intuition of veiled relations. However, a culture that only accepts concepts by intuition is instantly prohibited from developing Western science (Northrop 186). Ergo the Chinese thought-system has to be polished to establish itself as a viable alternative. How the refinement is carried out is open for discussions—be it through analytical reasoning to verify the intuition or other means. I am no prophet in sensing how the Chinese thought-system will end up if permitted to sprout. Yet suppose the framework successfully converts into “actual being”, we can expect a new, invigorating point of view on examining the intricate man-and-nature relationship.

### **3. On Language of Human-nature Interaction**

#### **3.1 Newton and Needham’s argument**

Following my statement on the resemblance of Chinese thought-system and “potential being”, Newton raised the enquiry regarding the cause of change, or the main driver, behind its potential advancement. He then provided his answer: Mathematics, which he also considered as the universal language of modern science. It transcends the physical reality that confronts our senses, allowing humans to gain insights into real world sense experience and jump to a mathematical world with abstract ideas of infinity. Newton further brought out his old quote that “Nature is pleased with simplicity, and affects not the pomp of superfluous causes” (50). He believed that fundamental laws of nature, being the essence of modern science, should be expressed in mathematics.

Needham then concurred with the view of integrating mathematical elements in modern science (*Science and Civilization* 1). However, he did

not consider mathematics as the driving force for the evolution of Chinese thought-system. In fact, he declined the idea of having a driving factor leading to the prosperity of the system: “[N]othing was uncaused, but nothing was caused mechanically. The organism of the universe was such that everything fitted into its place and acted according to an eternal dramatic cycle” (*Shorter Science* 216). The thought-system, just like other things in nature, follows its intrinsic nature and position in the whole world-organism. Its connection with other beings in the stratified pattern will shift it to its natural, appropriate position, based on inter-resonance. Regarding the language concerned to dialogue with nature, he opined that principal forces of nature could be manifested in all levels of life and could enrich our social and ethical life (207). Therefore, the two fundamental forces of the Ying and Yang, or more essentially *shen* and *ling* were considered to be the vital origin for linking individuals to each other and to nature.

### 3.2 My stance

Following Newton and Needham’s logical deductions I was convinced that both mathematics and vital forces could be the language for human-nature interaction. The major criterion for a well-established language would be its simplicity. Simplicity means more than being reliable, repeatable and predictable—it also has to be stackable. George Whitesides states that in stackable simplicity we could build things upon it in some n-dimensional space (“Toward a Science of Simplicity”). I found great correspondence of this concept in Lego, in which the building blocks can be stacked laterally and vertically to create endless possibilities. Considering mathematics as Lego bricks, it has established footholds in all areas of science and altogether a modern system towards comprehending nature is built. Similarly, Yin and Yang, with its 64 symbolic hexagrams, exerted influence in Chinese

astronomy, literature, music, etc., founding a universe that is dependent on the harmony of the two forces.

I began to look for further examples of possible languages, and came across the book titled *Information: The New Language of Science*. The book suggests that under the current digital era, humans “traffic in disembodied clouds of information” (von Baeyer 5). Should information be known as a viable language? Based on the above criteria the answer would be negative, since information’s stackability is subjective to the complexity of ideas hidden inside, it is deemed impossible to standardize information with a rigid framework. In simple terms, they are not basic Lego bricks.

#### **4. On Fuller Understanding of Nature**

There serves huge significance in looking into both Western science and Chinese thought-system. Even though the Chinese system seems inferior when compared to the flourishing modern science, we should not overlook its insightful ideas that examine nature at a fresh perspective. The mistake we have made is that we incorporated the idea of “survival of the fittest” into the unnecessary competition between Western and Chinese systems, and judging their worthwhileness largely by recent contributions. As Needham’s Grand Question suggests, the Chinese were once efficient in “applying human natural knowledge to practical human needs” (Sivin 221), and that implies the Chinese thought-system can provide a certain degree of enlightenment. It is indeed time for us to look into ancient Chinese readings and “rescue them from the brink of extinction”.

With multiple strong streams of scientific thinking, we can make sense of nature holistically by complementing their major takeaways and overcoming their limitations. For example, Needham proposed that modern science needed to adopt the concept of “the universe as a vast organism”

in tackling questions related to the higher nervous centers of mammals (218). The delicacy of nature hence requires inputs from various scientific systems to be fully figured out.

## 5. Conclusion

In brief, there are multiple approaches and languages towards dialoguing with nature. By analyzing and reasoning with those scientific systems, we can achieve better man-and-nature interaction, pull ourselves closer to the ultimate truth instead of detouring around the trail towards reality, and appreciate the brilliant actualities outside the cave.

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### **Teacher’s comment:**

Comparison between Chinese and Western views towards nature is always not an easy task to handle. In this essay, Hiu Chung approached this issue in two interesting perspectives—comparisons on the nature of scientific views and the fundamental languages of nature between Chinese and western cultures. Hiu Chung showed very good understanding on the texts, which provided a solid ground for his comparisons. Not only did Hiu Chung follow



the opinions of the renowned thinkers, he also presented his own stance on the issues and reflected on the value of Chinese thought on human understanding of nature. (Derek Cheung)